Pore-Size Engineering

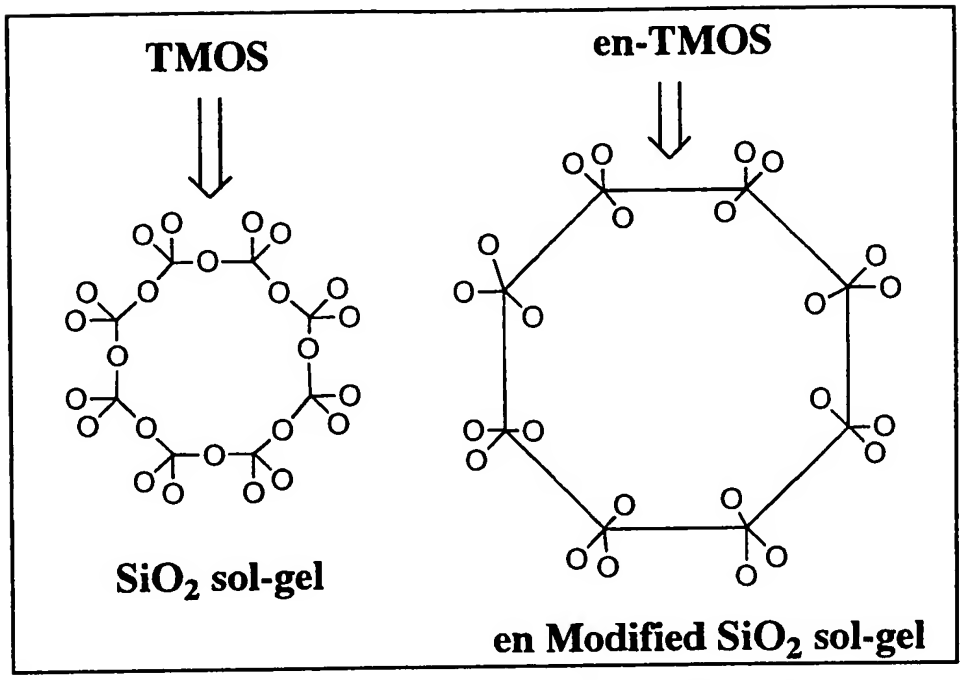


Fig.1a shows the enlargement of pores in the enTMOS gel in comparison to TMOS due to the inclusion of the rigid organic spacer group.

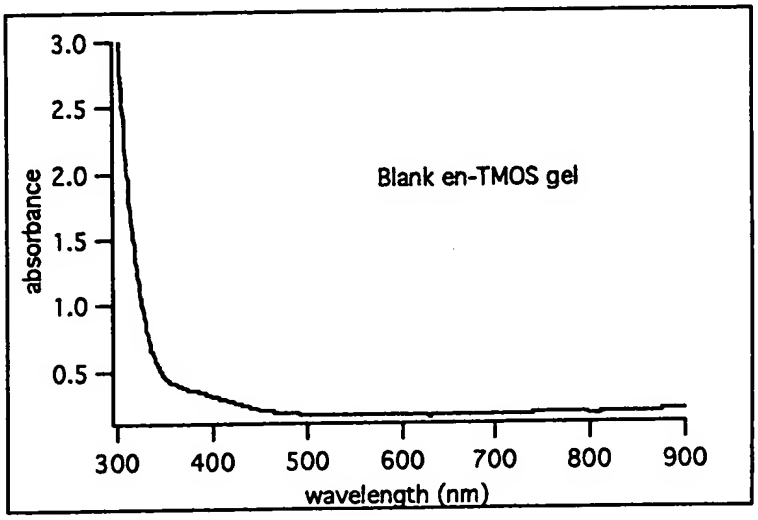


Fig.1b shows a tail in the yellow region ~ 380-400nm indicating the enlargement of pores.

Chemomechanical responseof enTMOS gels

Effects of solvent polarity

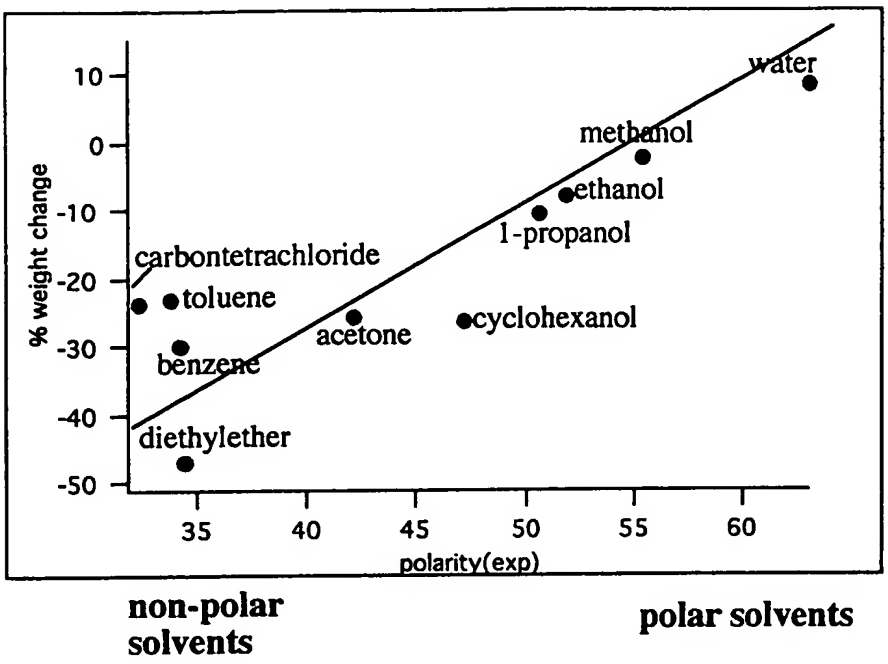


Fig.2 shows an increased % weight change in enTMOS gel in polar solvents as compared to non polar solvents.

Thermomechanical Response of enTMOS gels

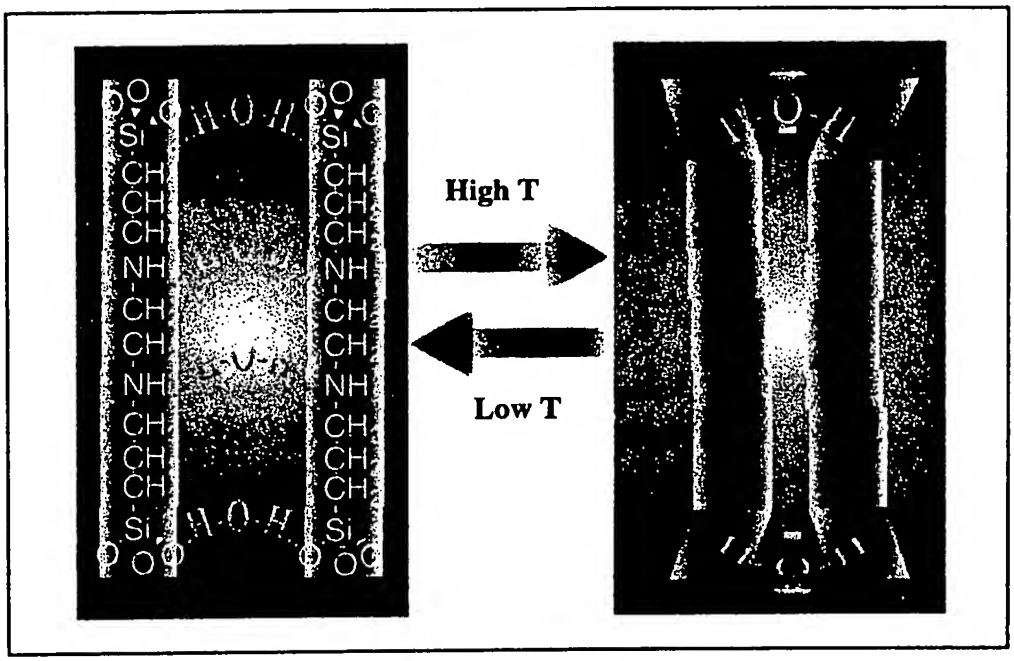


Fig.3a shows a reversible temperature dependent hydration-dehydration of the enTMOS gel, resulting in increased hydrophobicity at higher temperatures.

Thermomechanical Response of enTMOS gels

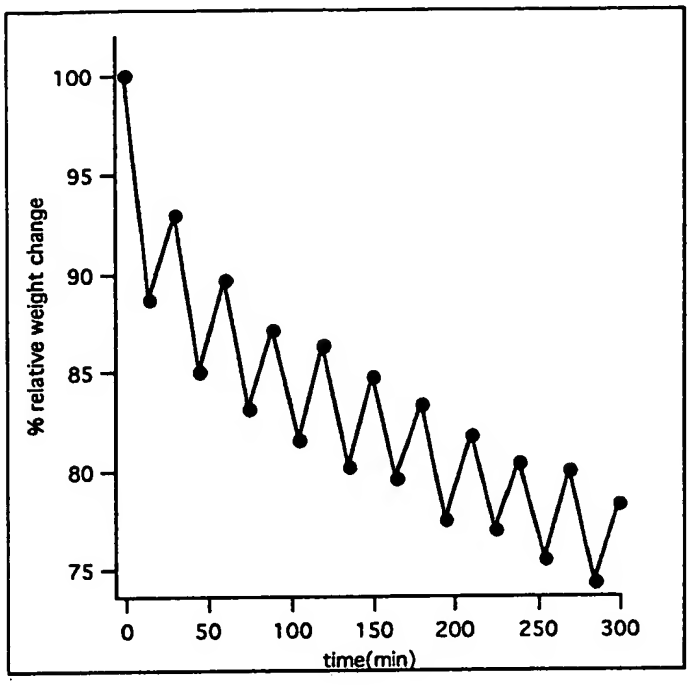


Fig.3 b shows a temperature dependent reversible % weight change in enTMOS gel with time.

Thermomechanical Response
Effects of Hydrophobicity/Hydrophilicity

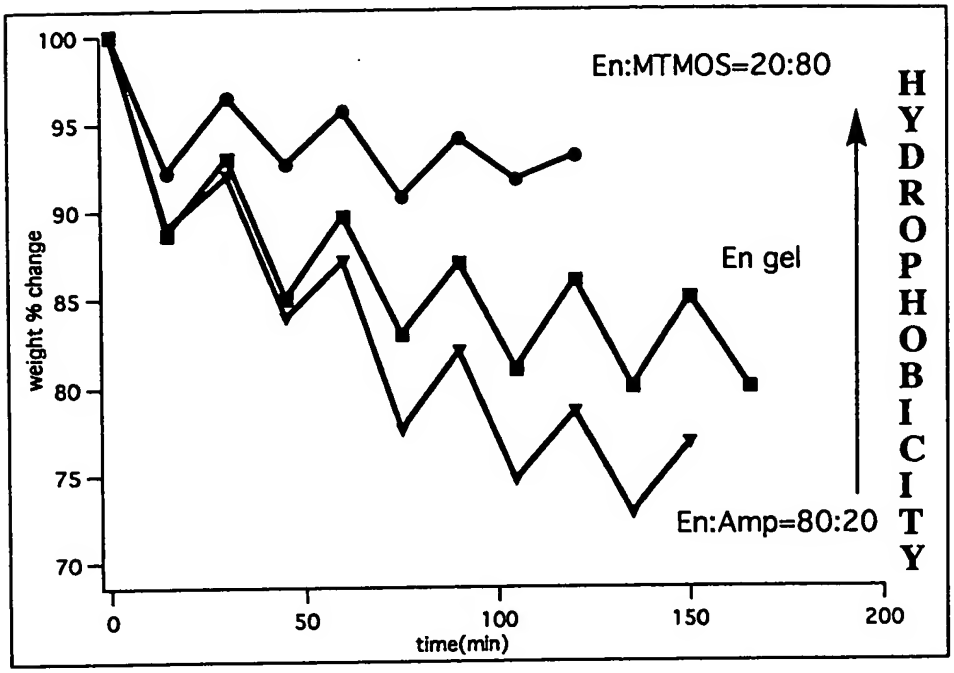


Fig.4 shows an increased % weight change in a material with greater hydrophilic composition than enTMOS and a decreased % weight change in a material with an increased hydrophobic composition.

Stability of Biomolecules in enTMOS gel

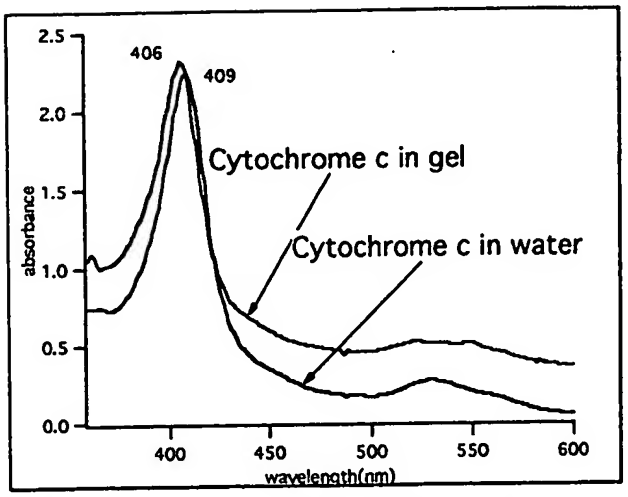


Fig. 5a shows the stability of Cyt*c* in enTMOS gel.

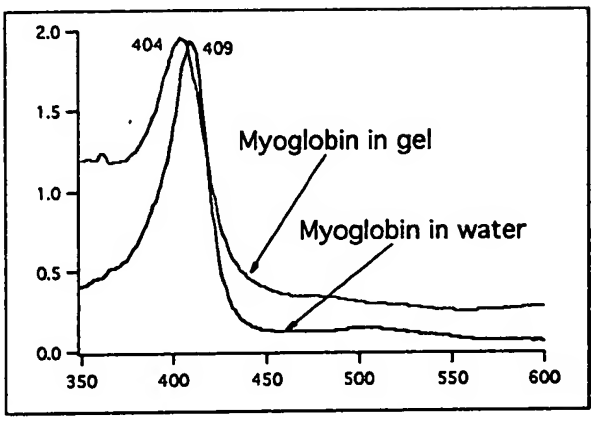


Fig. 5b shows the stability of Mb in enTMOS gel.

Encapsulation/Release of Biomolecules by enTMOS gels

● Release of Cyt c

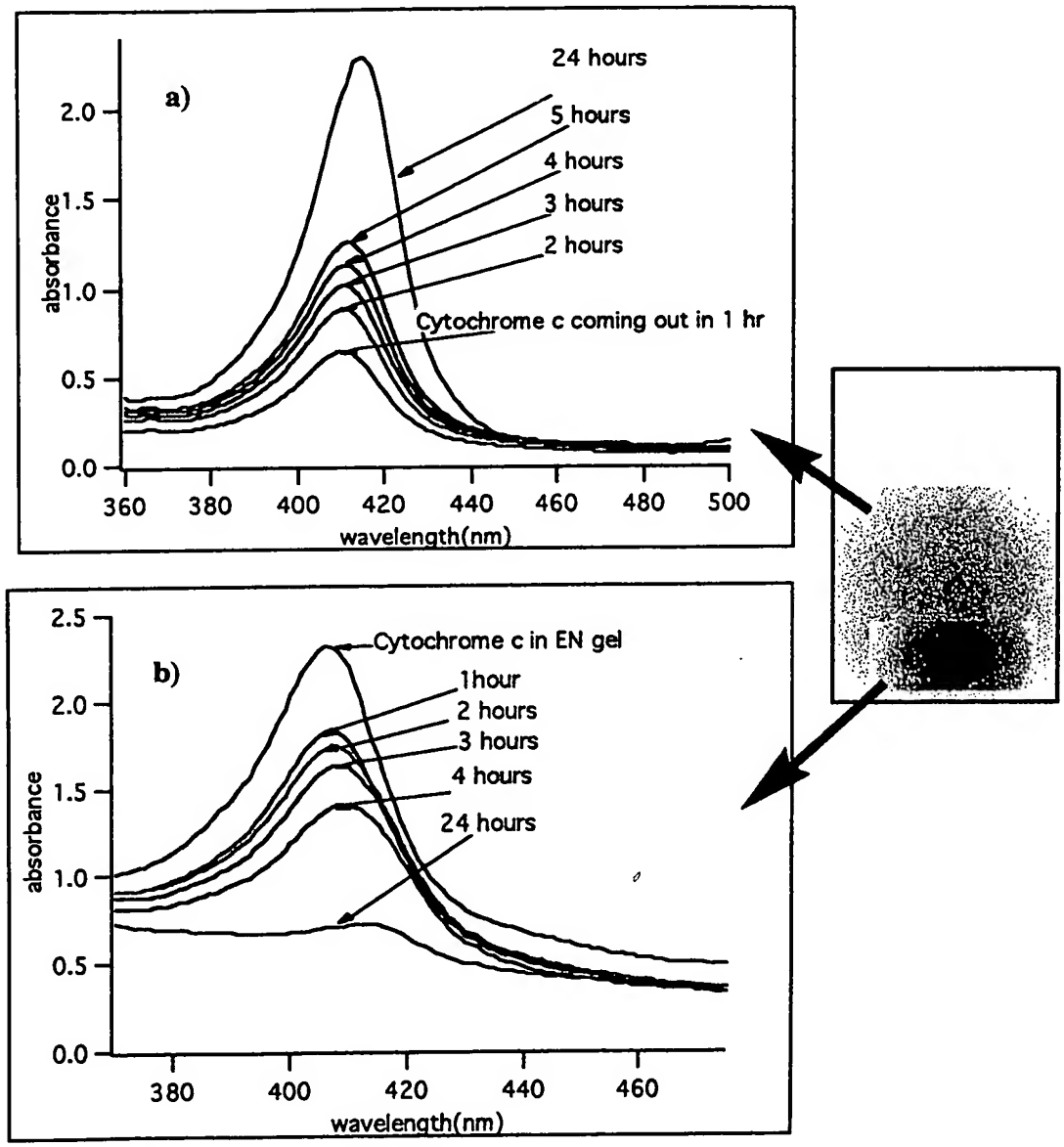


Fig.6 a)shows the release of Cyt*c* with time from the enTMOS gel in acetate solution. **b)**shows the release of Cyt*c* with time from the enTMOS gel.

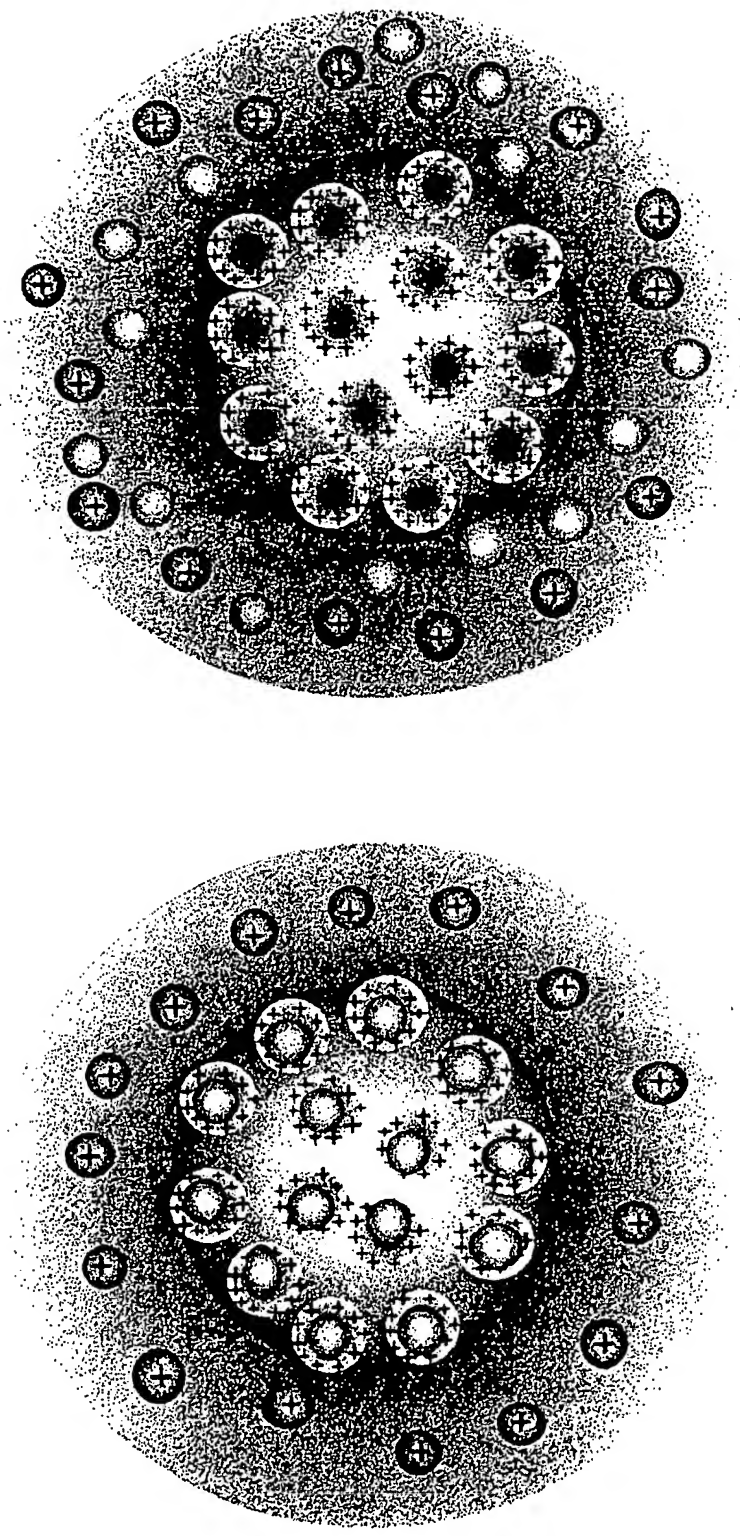
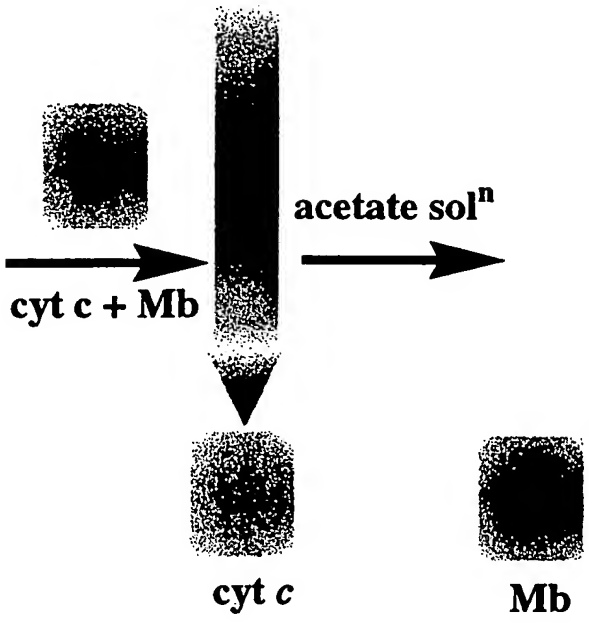


Fig.7 The positively charged enTMOS gel selectively picks up Mb or Hb(+2 charged) in comparison to Cyt c (+8 charged), from a mixture of Cyt c and Mb or Hb.

Separation of Biomolecules by enTMOS gels

Myoglobin and Cytochrome c



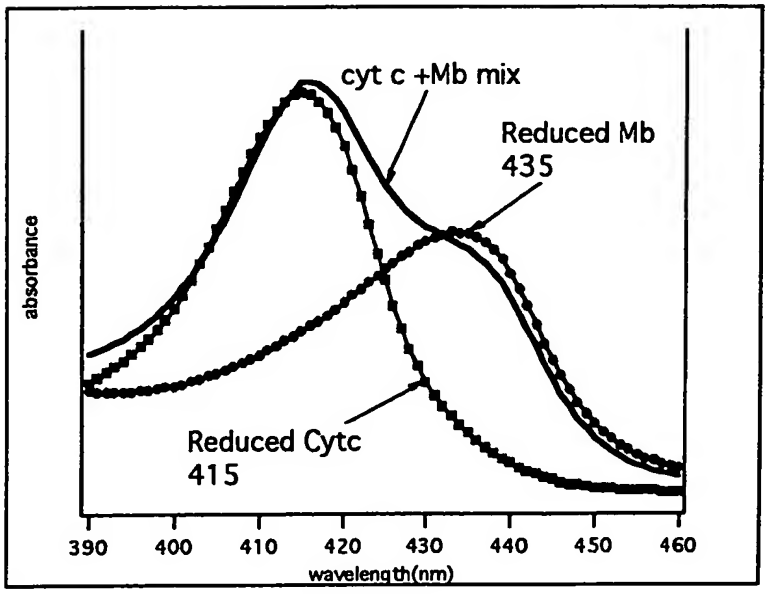


Fig.8 The curves show the separation of Cyt*c* and Mb after their mixture was passed through the column containing enTMOS gel in powdered form. Cyt*c* comes out first, followed by Mb which is eluted with acetate solution.

Separation of Biomolecules

Hemoglobin and Cytochrome *c*

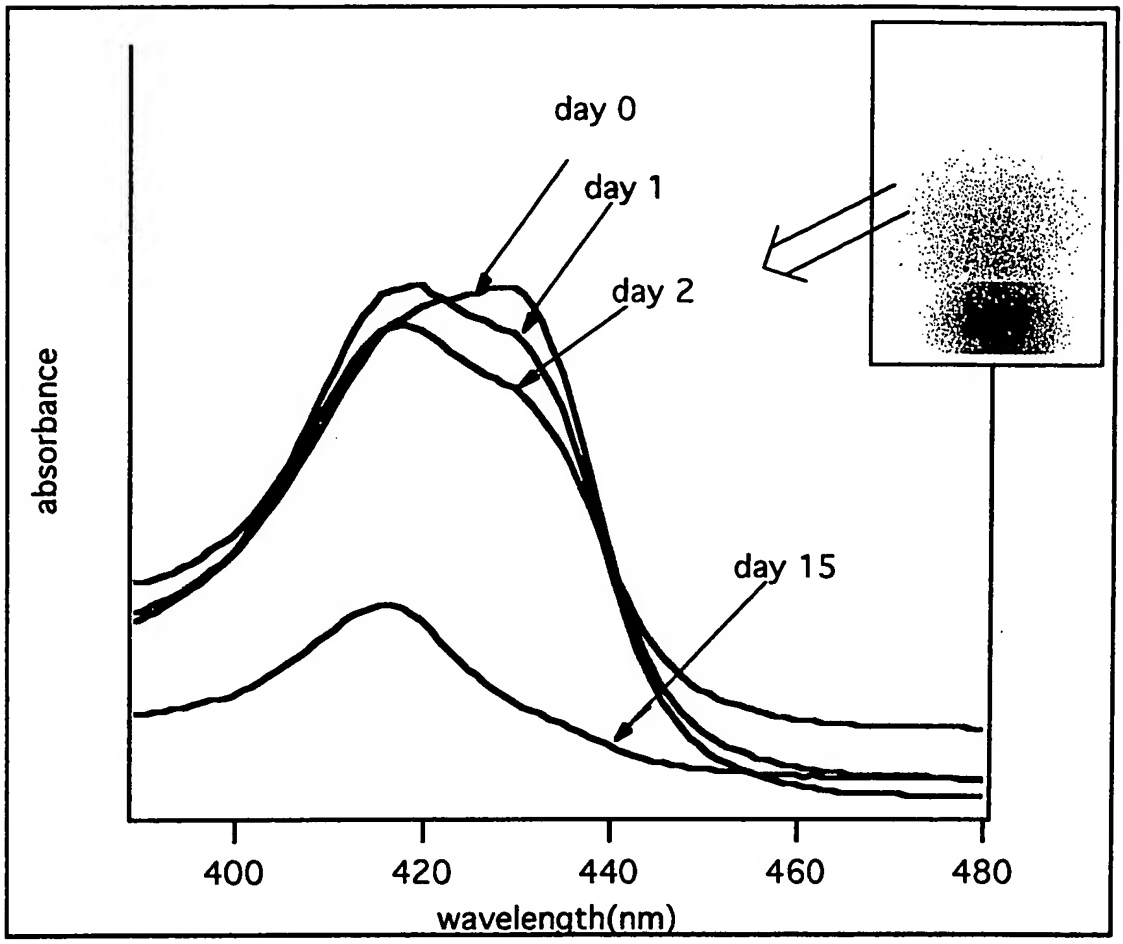


Fig.9 Monitoring the solution of Cyt *c* and Hb in contact with the enTMOS gel shows an increase in the ratio of Cyt *c* /Hb, indicating a selective intake of Hb over Cyt *c* by enTMOS gel.

Electromechanical response of enTMOS gels

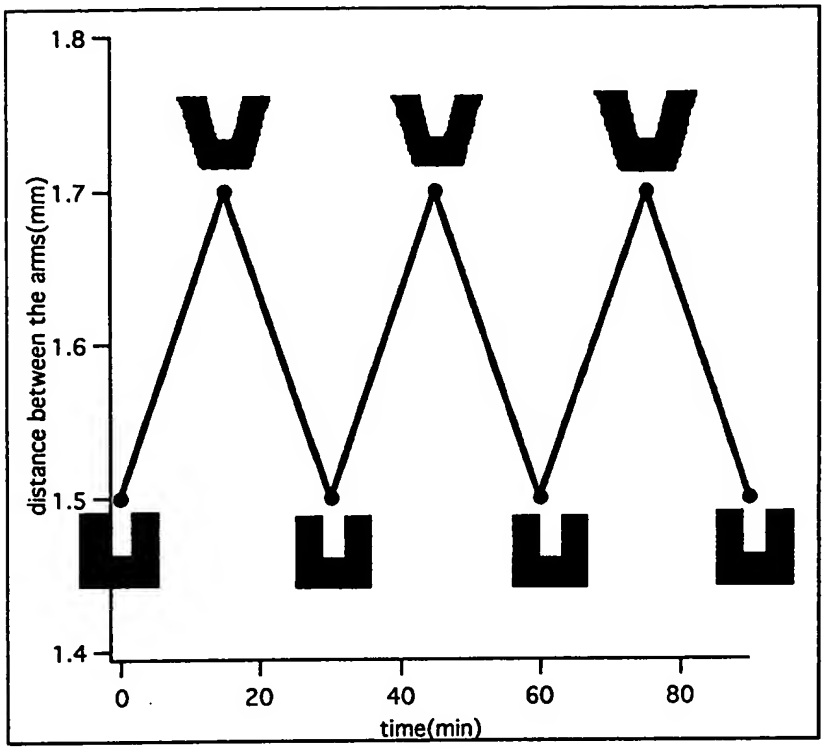


Fig.10 shows a reversible electromechanical response of enTMOS tweezers with an applied potential of 6V.

Influence of Environmental Stimuli on enTMOS

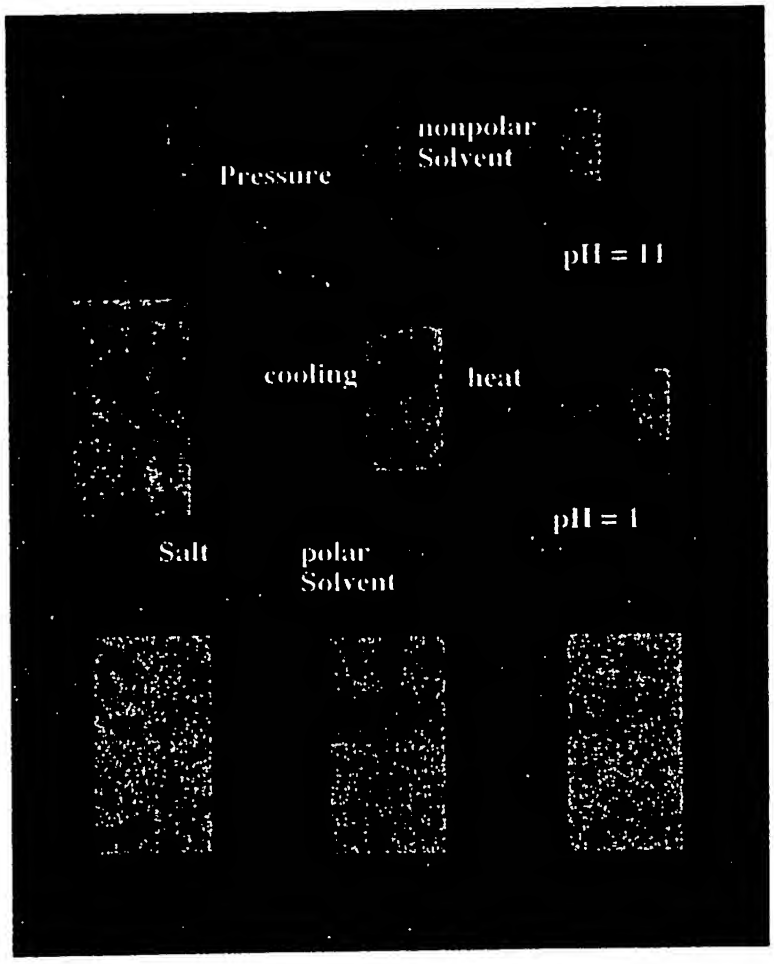


Fig.11 shows the influence of various environmental stimuli on enTMOS gel.

Metal ions intake by enTMOS gel

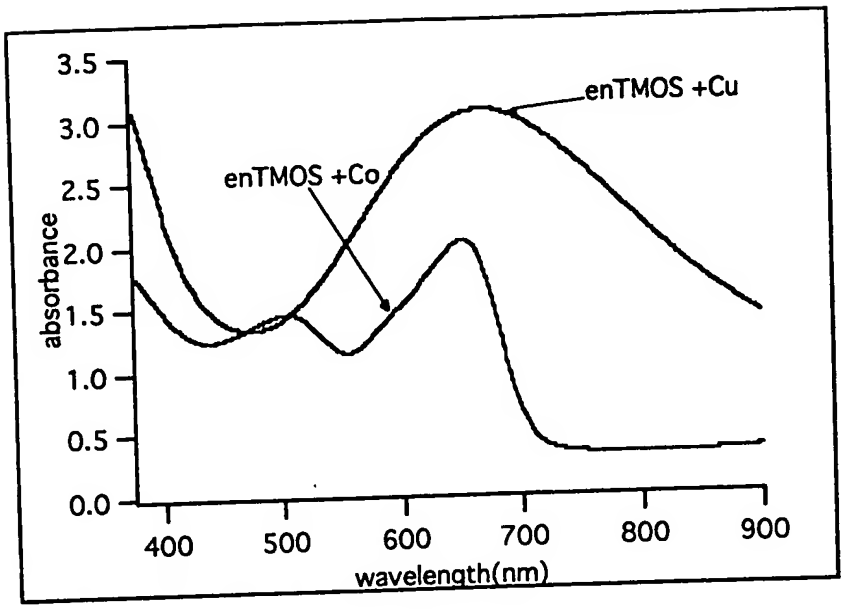
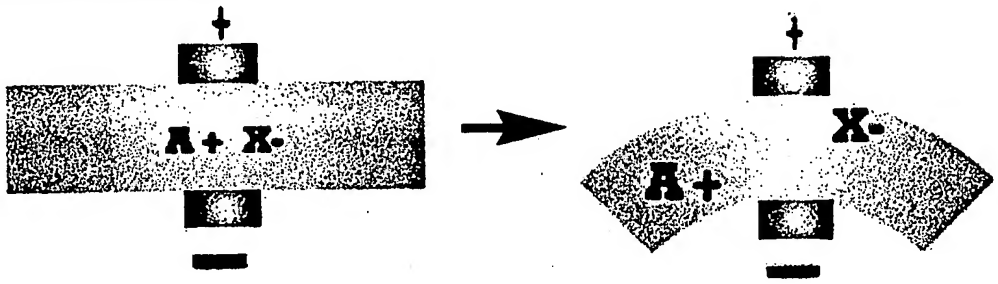


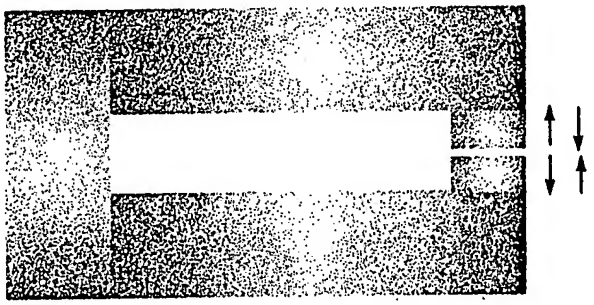
Fig.12 shows the intake of $Cu^{(+2)}$ and $Co^{(+2)}$ ions by enTMOS gel

enTMOS
Microelectromechanical Devices

● **Shape Memory**



● **Microtweezers**



● **Microsyringe / Micropump**

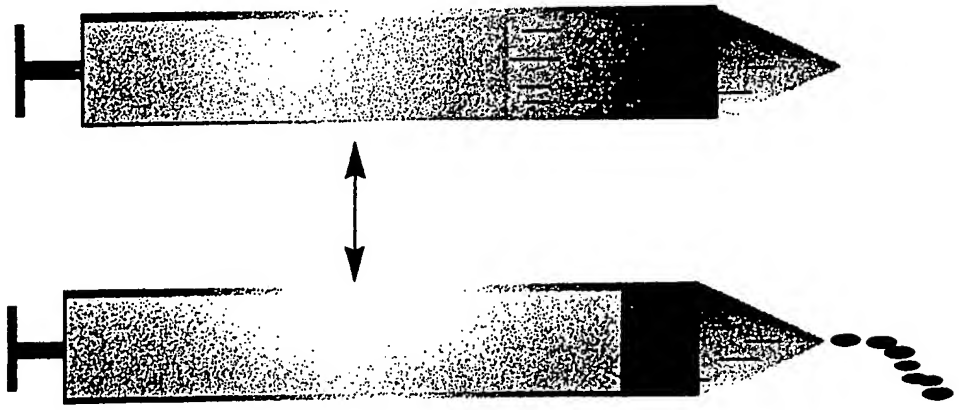


Fig.13 shows the practical devices that can be made out of enTMOS gel.